Assignment 1

In [2]:
```
import numpy as np
```

#1. a = [10,12,19,17,-13,18,27,30,-12,-27] #Convert the above list into a NumPy array and filter out the numbers with absolute #value(modulus value) less than 20

In [4]:
```
a = [10,12,19,17,-13,18,27,30,-12,-27]
array = np.array(a)
print("Array = ", array)
np.absolute(array)
```

```
Array =  [ 10  12  19  17 -13  18  27  30 -12 -27]
```

Out[4]:
```
array([10, 12, 19, 17, 13, 18, 27, 30, 12, 27])
```

In [11]:
```
filter_array = array < 20

new_array = array[filter_array]
print(new_array)
```

```
[ 10  12  19  17 -13  18 -12 -27]
```

#2.Create a NumPy array with the dimensions 10,2,5 using the arange function

In [62]:
```
n = np.arange(1,21,3)
n
```

Out[62]:
```
array([ 1,  4,  7, 10, 13, 16, 19])
```

#3.Write a NumPy program to create a vector with values from 0 to 20 and change the sign of the numbers in the range #from 9 to 15

In [52]:
```
x = np.arange(0,20)
print(x)
x[(x >= 9) & (x <= 15)] *= -1
print(x)
```

```
[ 0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19]
[  0   1   2   3   4   5   6   7   8  -9 -10 -11 -12 -13 -14 -15  16  17
  18  19]
```

#4.Write a NumPy program to create a 3x4 matrix filled with values from 10 to 21

In [24]:
```
a = np.arange(10,22).reshape((3, 4))
print(a)
```

```
[[10 11 12 13]
 [14 15 16 17]
 [18 19 20 21]]
```

#5. Write a NumPy program to create a 5x5 zero matrix with elements on the main diagonal equal to 1, 2, 3, 4 #(Hint: Google how to change individual values in np array)

In [51]:
```
x = np.zeros((5,5))
print(x)
x = np.diag([1,2,3,4])
print(x)
```

```
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
[[1 0 0 0]
 [0 2 0 0]
 [0 0 3 0]
 [0 0 0 4]]
```

#6Write a NumPy program to multiply two given arrays of the same size element-by-element

In [56]:
```
n1 = np.array([[1, 2, 3],
               [4, 5, 6]])
n2 = np.array([[7, 8, 9],
               [10, 11, 12]])
print(np.multiply(n1, n2))
```

```
[[ 7 16 27]
 [40 55 72]]
```

#7Write a NumPy program to create an array of equal shapes and data types of a given array

In [58]:
```
n = np.array([[1.4, 2.5, 3.6],
              [4.1, 5.2, 6.3],
             [7.7, 8.8, 9.9]])
print(n)
print(np.zeros_like(n))
```

```
[[1.4 2.5 3.6]
 [4.1 5.2 6.3]
 [7.7 8.8 9.9]]
[[0. 0. 0.]
 [0. 0. 0.]
 [0. 0. 0.]]
```

In [ ]:
```
```